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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,449	12/20/2004	Thomas Heidemann	12810.00003-US	7760
23416 7590 06/29/2007 CONNOLLY BOVE LODGE & HUTZ, LLP P O BOX 2207 WILMINGTON, DE 19899			EXAMINER BULLOCK, IN SUK C	
			ART UNIT 1764	PAPER NUMBER
			MAIL DATE 06/29/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/518,449	Applicant(s) HEIDEMANN ET AL.	
	Examiner In Suk Bullock	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 January 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>12-20-04</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3, 4, and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3, line 2 recites "obtainable" which is not clear because it is not know if the catalyst is obtained from the recited process or by some other process.

Claim 4, line 3 recites "if appropriate" which is not clear whether aluminum oxide is an optional component or not.

Claim 4, line 9 recites "obtainable" which is not clear because it is not know if the catalyst is obtained from the recited process or by some other process.

Claim 9, line 2 recites "if appropriate" which is not clear whether aluminum oxide is an optional component or not.

### ***Allowable Subject Matter***

Claims 1, 2, 5-8, and 10-16 are allowed.

The following is an examiner's statement of reasons for allowance: no prior art was found to disclose or suggest the claimed oligomerization process over a catalyst comprising sulfur and nickel in two or more successive catalyst zones wherein different molar S/Ni ratios are employed in the different reaction zones as recited in claim 1.

The prior art to WO 00/69795 (equivalent US 6,846,965 to Schulz et al. will be used for English translation) discloses a process for the oligomerization of C<sub>2</sub>-C<sub>8</sub> olefins in a plurality of successive reaction zones (col. 1, lines 4-6). A stream of an olefin-containing hydrocarbon mixture is passed over a heterogeneous, nickel-containing oligomerization catalyst in n successive adiabatically operated reaction zones, where n is greater than or equal to 2 (col. 3, lines 8-20). The catalyst volume in successive reaction zone is greater than that of the preceding zone, in general from about 30 to 60% by volume greater (col. 3, lines 35-45). Particularly preferred catalyst consist essentially of 10 to 70 wt% NiO, 5 to 30 wt % TiO<sub>2</sub> and/or ZrO<sub>2</sub>, 0 to 20 wt% Al<sub>2</sub>O<sub>3</sub> and SiO<sub>2</sub> as the balance. Such a catalyst is "obtainable" by precipitation of the catalyst composition at pH 5-9 by addition of an aqueous solution comprising nickel nitrate to alkali metal water glass solution containing TiO<sub>2</sub> and/or ZrO<sub>2</sub>, filtration, drying and heat treatment from 350 to 650° C. See col. 4, lines 43-53. The olefin-containing hydrocarbon mixture used is generally a mixture consisting essentially of olefins and saturated hydrocarbons (col. 5, lines 9-32).

The prior art to Vicari (US 5,849,972) discloses a similar process using a similar catalyst as that of Schulz. Vicari further discloses that the metal salts used are nitrates, sulfates or acetates of the metals (col. 4, lines 10-11). Upon calcinations sulfur would be formed and therefore would be contained in the catalyst.

Thus, a combination of Vicari would lead to the claimed oligomerization catalyst using successive catalyst zones. However, there is no suggestion by either reference

Art Unit: 1764

to the claimed employment of different molar ratio of sulfur to nickel in the different reaction zones as recited in the present claim 1.

Claims 3, 4, and 9 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to In Suk Bullock whose telephone number is 571-272-5954. The examiner can normally be reached on Monday - Friday 6:00-2:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1764

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*J. Bullock*  
I.B.

  
Glenn Caldarola  
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Technology Center 1700